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MODELLING THE DISTRIBUTION OF *SERIPHIUM PLUMOSUM* IN MSUKALIGWA LOCAL MUNICIPALITY, MPUMALANGA PROVINCE

By

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Abstract

The spread of *Seriphium Plumosum* is a critical ecological problem threatening grazing land in South Africa. *Seriphium Plumosum* is indigenous to South Africa and is spreading to other countries in Africa. Mapping the spatial distribution of *Seriphium Plumosum* is vital towards the management of its population and it will assist researchers, farmers and government to understand the environmental conditions favoured by the species. The main aim of the study is to examine and predict the spatial distribution of *Plumosum* using some abiotic factors. Remote sensing, Geographic Information System (GIS) modelling and ground truthing were combined, in order to achieve this goal. Unsupervised classification method was employed to classify the land cover and to guide the field work. Global Positioning System (GPS) coordinates were collected in the field to assist in manually digitizing the encroachment of *Seriphium Plumosum* from the satellite images and also to produce the locality map of *Seriphium Plumosum*. Digitized polygons were used to create training samples and to create the spectral signature of *Seriphium Plumosum*. Spectral signature and some abiotic factors were added into the Maximum likelihood classifier and classification results were seriphium Plumosum favourable conditions. The classification output indicates that *Seriphium Plumosum* prefers deep to very deep soil with loam clay, loams and sandy loams. It also indicates that *Seriphium Plumosum* prefers flat areas with rainfall between 651 to 750mm. The weight of each condition was ranked and incorporated into the model. The model output is in the form of a map which indicates the possible areas that can be invaded by *Seriphium Plumosum*. Ground verification was conducted to assess the accuracy of the model.

Key Words: *Abiotic factors, Classification, Digitizing, Distribution, Modelling, Geographic Information System, Encroachment, Global Positioning System, Remote sensing, Seriphium Plumosum.*